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Conference Abstract

From Expert to Data-Driven Biodiversity Knowledge: Assessing ecosystem irreplaceability with IUCN Red List data for freshwater fish

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Abstract

Critical as they are for humans and nature, freshwater ecosystems are threatened—but the extent and depth of these threats are not well understood, especially if essential biodiversity data are lacking. Any policy aimed at protecting such ecosystems must first assess the threat factors and the potential harm, well before proposing conservation measures such as the creation and development of Protected Areas (PAs). These assessments must be done using a deep and sound knowledge of the actual and potential biodiversity variables. Freshwater ecosystems have been largely neglected in traditional PA design and management (Abell et al. 2007), be it for scarcity of biodiversity data, or for more perception-related reasons such as visibility and accessibility driving the allocation of conservation resources to more data-rich environments.

In an effort to contribute to shifting this state of affairs, we have developed an irreplaceability index to identify the most relevant places to achieve conservation aims for freshwater fish, based on the International Union for the Conservation of Nature (IUCN) Red List, which, in turn, should be founded on available biodiversity data upon which expert knowledge is based (Le Saout 2013). However, we found large assessment gaps in the IUCN Red List for freshwater fish. These gaps may result from the non-systematic acquisition of primary biodiversity data, which could eventually be alleviated by coordinated

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policies promoting ecosystem surveys tailored at increasing the availability and spread of such data, while identifying, targeting and prioritizing hotspots. Obtaining valid conclusions from low-assessment areas such as South America, which are simultaneously biodiversity and endangerment hotspots (Collen 2014), is particularly troublesome.

Building an irreplaceability index requires access to abundant, fine-scale biodiversity data. When combined with the assessment information available in the IUCN Red List, we can identify those areas where low assessment rates for highly irreplaceable rivers become keystones to protect freshwater biodiversity, and can therefore suggest actions for policy makers to take at both regional and local scales. In particular, we have thus identified those irreplaceable rivers that fall outside the current net of PAs. In a context of inadequate investment in biodiversity conservation (Juffe-Bignoli et al. 2016), our findings and the informatics-powered methods we propose, will hopefully help decision makers establish conservation priorities and allocate funds to preserve irreplaceable rivers and their fish fauna. Furthermore, the necessity of improving the IUCN Red List in low-assessed areas, requires synergies among IUCN, Global Biodiversity Information Facility (GBIF) and conservation scientists to achieve accurate and reliable assessments.

Keywords

assessment gaps, biodiversity hotspots, conservation priorities, freshwater biodiversity, protected areas

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